VIRGINIA MINERALS

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF MINES, MINERALS AND ENERGY
Richmond, Virginia

Published quarterly by the DIVISION OF MINERAL RESOURCES
Natural Resources Building, McCormick Road, Charlottesville, VA 22903

Vol. 32 May 1986 No. 2

MOREFIELD PEGMATITE MINE REOPENS - VIRGINIA'S ONLY ACTIVE UNDERGROUND GEM MINE

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Powhatan Mining Company, operated by W. D. "Bill" Baltzley, acquired the Morefield pegmatite mine in March, 1985. The operator plans to develop commercial mining for gem and strategic materials as well as to allow collecting for a fee. The mine is located on an 80-acre tract 3.8 miles east-northeast of Amelia Court House, Amelia County, 0.4 mile off the northeast side of State Road 628 (Figure 1). A brief description of the mine was provided by Sweet and Penick (1985) in a listing of sites that are open to collectors for a fee.

The complex pegmatite was first opened by Silas V. Morefield in 1929 and was worked for mica and feldspar by the Seaboard Feldspar Company in the early 1930's. Morefield operated the mine intermittently until about 1940; some exploratory work was done by the Seaboard and Southern Minerals, Inc., in 1941. The next year the mine was leased to the Minerals Separation Corporation of North America and later in 1942 was taken over by the Metals Reserve Company and finally was returned to Morefield in January 1943.

The mine, when taken over by Metals Reserve Company, consisted chiefly of an open pit 230 feet long, 8 to 60 feet wide, and about 25 feet deep. There was also a (caved) shaft, about 45 feet deep, near the west end of the pit, as well as several prospect pits along the strike of the pegmatite body. During 1943 and 1944, Morefield enlarged and deepened the shaft to about 60 feet below ground level and started drifts along the north wall at about the 45-foot level.

The United States Bureau of Mines first explored the pegmatite during the summer and fall of 1943. To prove the extent of the deposit, they crosscut the dike with a bulldozer in five places and put down five diamond drill holes (Figure 2). They also removed and washed a considerable area of placer material in the creek bottom immediately south of the mine.

In 1948 the property was leased by the United States Bureau of Mines, and experimental development and mining were carried on for several months. The Morefield shaft (Figure 3) was dewatered and deepened to 115 feet. The Bureau also enlarged the drifts at the 45-foot level, driving a drift 75 feet southwestward from the shaft at the 100-foot level and raising to about the 45-foot level from this southwestward drift. Exploratory work by the Bureau showed the pegmatite body to have unusually large dimensions. The pegmatite has been proved on the surface for a distance of over 1,000 feet along the strike and vertically to a depth greater than 200 feet; its inferred dimensions are considerably greater. The body ranges in thickness from 5-16 feet in the pit to 30 feet in bulldozer trench No. 5, about 720 feet west of the pit; drill holes show that it

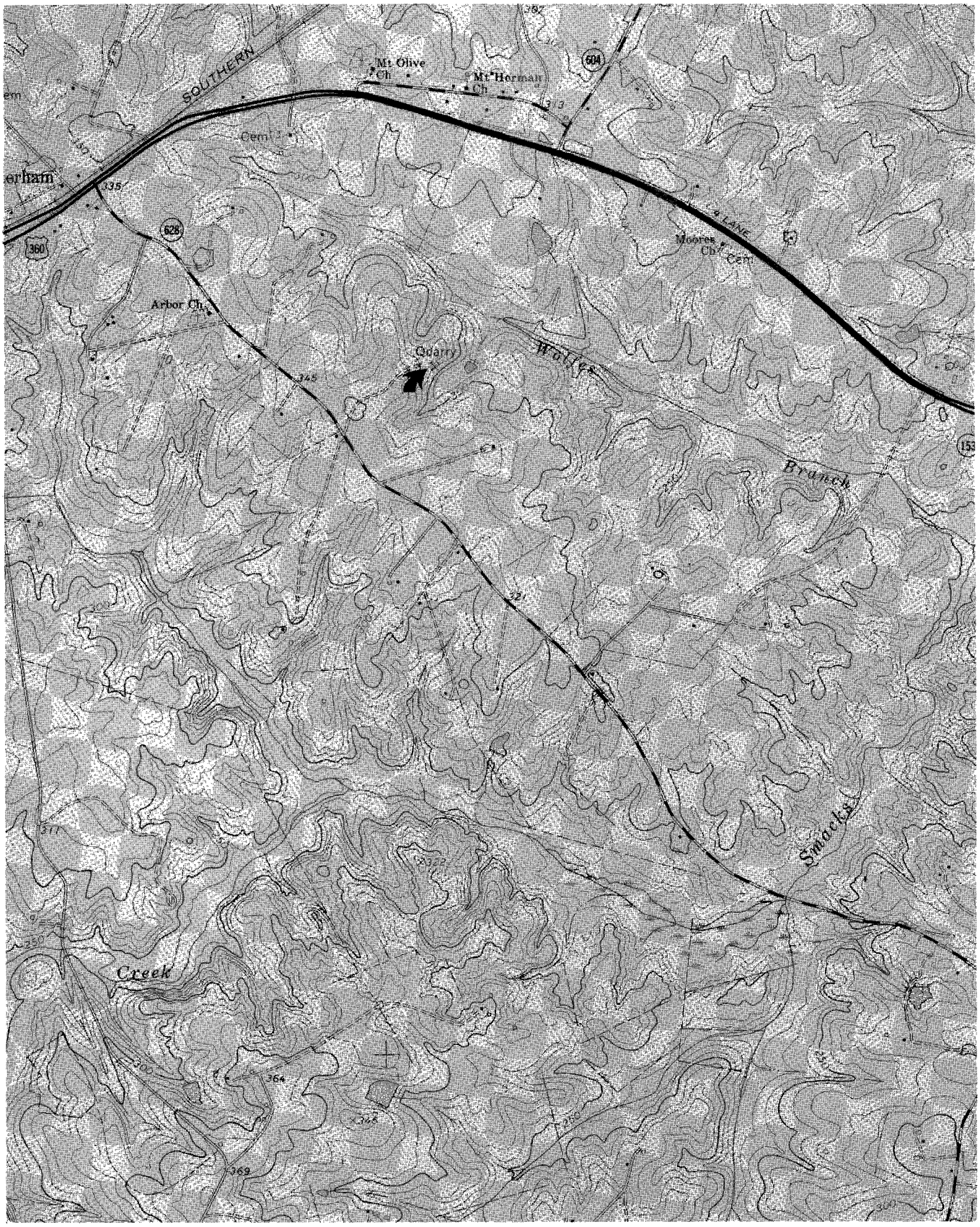

Figure 1. Location of Morefield Pegmatite Mine, Amelia County.

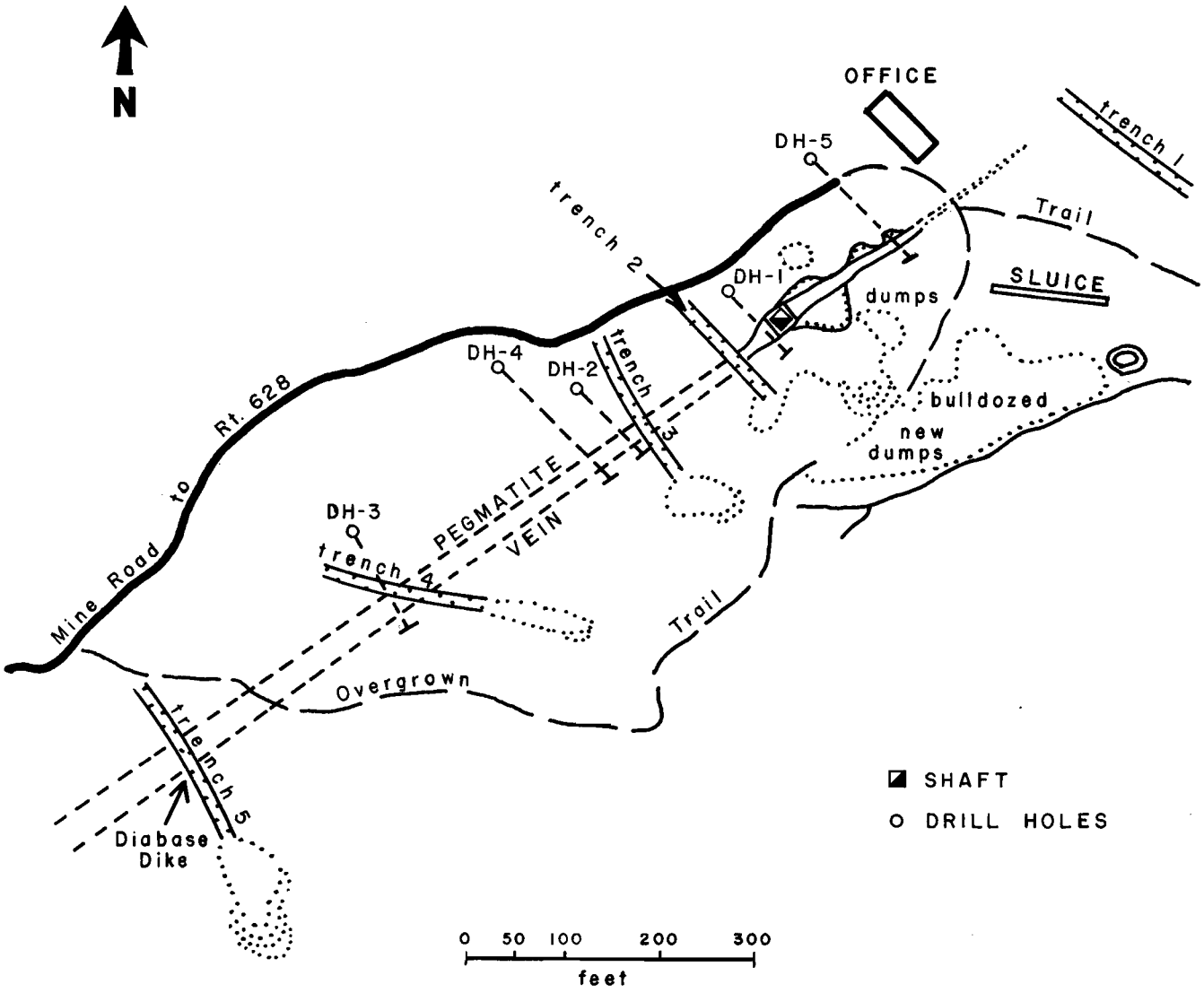

Figure 2. Sketch map of Morefield mine showing location of shaft, trenches, and diamond drill hole locations (Brown 1962, modified by Baltzley 1985).

tapers downward. It strikes about N47°E., is nearly straight, and has a northwestward dip only a few degrees from the vertical. The wall rock is mostly dark-gray, biotite hornblende gneiss.

Brown (1962) states that the eastern part of the pegmatite body, for a distance of about 300 feet, is mineralogically complex. Westward, at the surface, the body becomes relatively simple and is composed chiefly of partly kaolinized, buff-colored perthite (feldspar), small amounts of muscovite and biotite, and stringers and masses of glassy quartz. In addition to these minerals, Glass (1935) lists the following from the complex portion of the dike: beryl, cassiterite, columbite, fluorite, galena, manganotantalite, microlite, monazite, phenacite, pyrolusite, spessartine, topaz, tourmaline, triplite, zinnwaldite, and zircon. Additional minerals identified in more recent investigations include: allanite, almandite-spessartine, apatite, bertrandite, chalcopyrite, pyrite, and rutile.

The complex portion of the pegmatite contains a considerable quantity of phenacite and an abundance of large crystals of topaz and zinnwaldite. Some of the topaz crystals are gem quality (Figure 4). Zonation at the Morefield is irregular, but quite distinct. The main opening has been described by Glass (1935) as follows:

> "The minerals of the Morefield dike show a symmetrical zonal arrangement, with an irregular middle zone of smoky quartz, intergrown on its

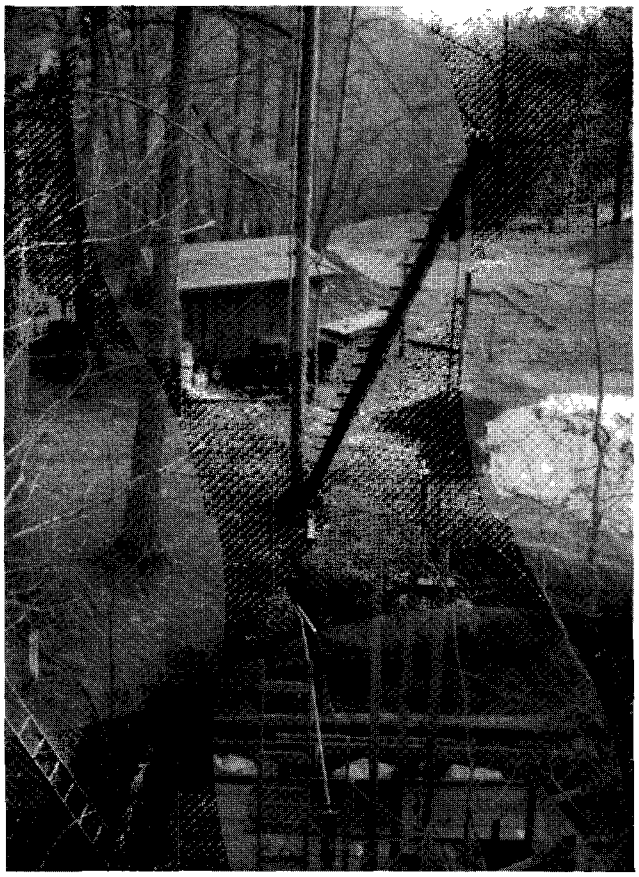

Figure 3. Morefield pegmatite mine shaft, January 1986.

> borders with large crystals of beryl and topaz. The blue-green microcline (amazonite) borders the quartz zone on both sides; albite and muscovite with occasional crystals of garnet form an irregular zone on the wall side of the amazonstone. The narrow, fine-grained selvage bands composed of biotite and quartz occupy the contact between the coarse-grained pegmatite mass and the country rock, and are probably reaction zones with the country rock."

Brown (1962) further noted that core quartz is not everywhere present; and locally, amazonite of the intermediate zone gives way to buff perthitic microcline, into which it is gradational. Because they include veinlets, both varieties of potash feldspar are thought to be older than quartz of the core. Crystals and masses of topaz, phenacite, and beryl occur with perthite near or within quartz of the core. Silas Morefield reported one topaz crystal that was 44 inches long

Figure 4. Topaz crystal (0.75 inch long) from the Morefield pegmatite mine (specimen and photograph, Howard Freeland).

and weighed 500 pounds; some small crystals showed double terminations. Phenacite, which forms colorless to milky white crystals and masses as much as 4 inches long, is commonly difficult to distinguish visually from topaz. The mineral is considerably higher in beryllium content than beryl and when sold with beryl tends to raise appreciably the percentage of beryllium oxide (BeO). Beryl, is fairly plentiful in the main mine workings and in the first trench to the west. Some beryl crystals reach several feet in length. About 500 pounds of placer beryl were also recovered by the Bureau of Mines from the stream flat south of the pit. It is reported that about 7 tons of beryl were sold from the mine prior to 1944.

Generally cleavelandite albite appears to be of late origin in that it fills crevices in or replaces the more common minerals such as quartz and muscovite with which it is associated. Several less-common minerals, including yellow beryl, calcite, cassiterite, manganotantalite, microlite, monazite, tantalite-columbite (Figure 5), and zircon, are closely associated with and occur within interspaces between cleavelandite plates. Tantalite-columbite also occurs but in minor quantities in buff perthite. Lemke, Jahns, and Griffitts (1952) report production between the years 1929 and 1944 of 1,423 pounds of tantalite minerals, then valued at $1,542.75.

Book muscovite, locally in crystals 10 to 12 inches across and 3 to 7 inches thick, occurs mainly in the inner part of the albite-quartz-perthite-mica wall zones. The muscovite, most abundant on the northwest side, is generally light amber-colored, clear, and flat; some of it has a tendency to be "gummy," or not split cleanly.

Figure 5. Tantalite crystal (approximately 2 inches across) from Morefield pegmatite mine (specimen and photograph, Howard Freeland).

During the period 1943-1944, approximately 7 tons of scrap mica, valued at $90.00, and 630 pounds of trimmed punch and sheet mica, valued at $3,775.00, were sold from the mine.

In the early 1980's, there was some company interest in the tantalite-columbite series minerals as the value topped $100/pound. Some sampling took place on the dumps and a few shallow trenches were cut southwest of the shaft.

When Mr. Baltzley acquired the Morefield mine in March, 1985, his objective was to create a recreational as well as a commercial mine. The recreational aspect of the Morefield mining development is promoted by its fame as a classic source of some 40 mineral and gem varieties. Amazonite from the mine was used in making a necklace (Figure 6) by craftsmen in Idar-Oberstein, Germany (a town world famous for its gem cutting and high quality jewelry). The necklace was sold to the Harvard Mineralogical Museum in April, 1962. The Morefield mine has long been noted for producing fine gem-quality amazonite. Currently material of excellent quality is mined from the 45-foot level, which recently was dewatered and retimbered.

In the interest of creating an attractive recreational mine, such features as a sluice box (Figure 7) exhibits, gem cutting, and goldsmithing, and at this time primitive camping, and so forth will also be provided. Some limited vein digging may be possible in addition to searching in dump material. A rock shop and museum (Figure 8) are presently under construction at the mine.

The mine is open all year; the collecting fee is $5.00 for adults and $3.00 for children. Group rates are available. For more information, write Powhatan Mining Company, Route 4, Box 310, Amelia, Virginia 23002. Telephone number - 804/561-3399.

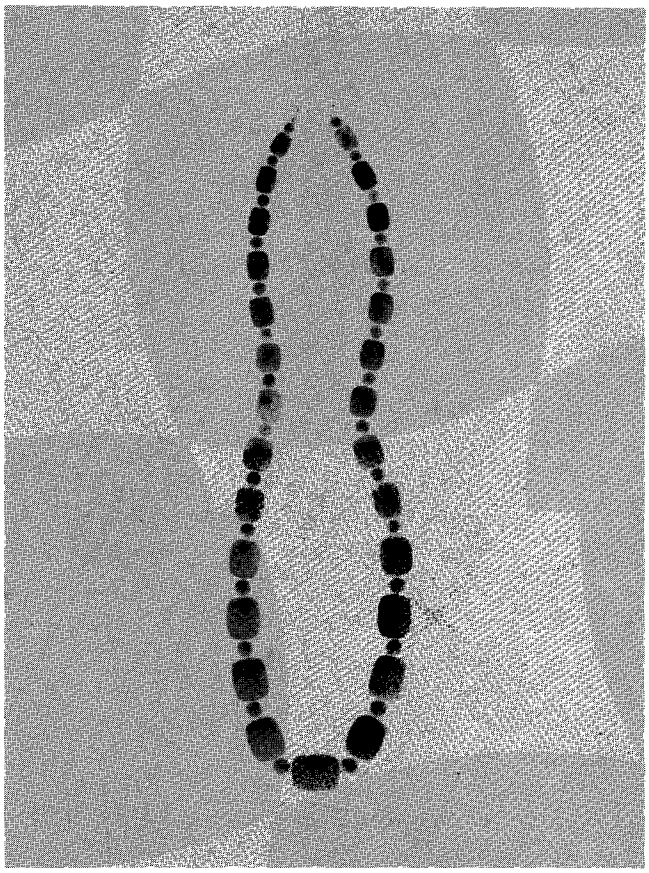

Figure 6. Amazonite necklace, Harvard Mineralogical Museum - still on exhibit (photograph courtesy of W. D. Baltzley).

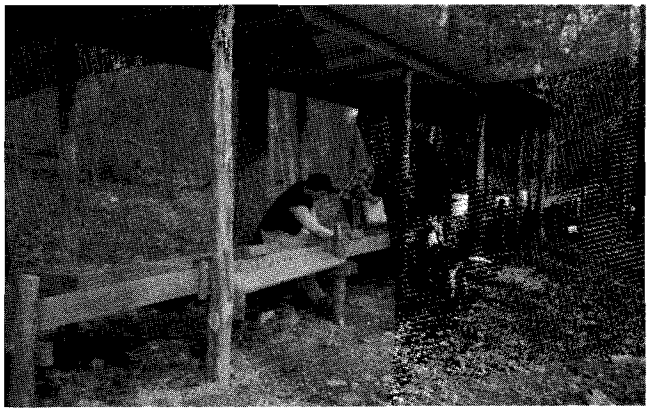

Figure 7. Sluice box at the Morefield pegmatite mine (W. D. Baltzley photograph).

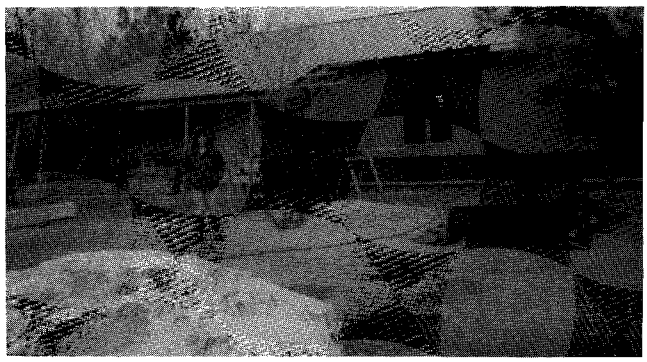

Figure 8. Rock shop and museum, under construction (January, 1986), (W. D. Baltzley photograph).

REFERENCES

Brown, W. R., 1962, Mica and feldspar deposits of Virginia: Virginia Division of Mineral Resources, Mineral Resources Report 3, 195 p.

Glass, J. J., 1935, The pegmatite minerals from near Amelia, Virginia: American Mineralogist, vol. 20, p. 741-768.

Lemke, R. W., Jahns, R. H., and Griffitts, W. R., 1952, Mica deposits of the southeastern Piedmont: Pt. 2, Amelia district, Virginia: U. S. Geol. Survey Prof. Paper 248-B, p. 103-139.

Sweet, P. C. and Penick, D. A., Jr., 1985, Mineral and fossil collecting sites in Virginia: Virginia Division of Mineral Resources, Virginia Minerals, vol. 31, no. 3, p. 29-39.

TOPOGRAPHIC MAPS AND PRODUCTS PROGRESS

Several types of useful topographic maps and products have been received since January 1, 1986. Twenty-seven photorevised maps are shown in Figure 1. Twenty-six black and white orthophotoquads, scale 1:24,000, are now available for portions of the central section of the state (Figure 2). Regional multicolor maps at the scale 1:100,000 can be obtained for the Petersburg, Tappahannock, Virginia Beach, and Williamsburg areas (Figure 3). A false-color satelite image map, scale 1:250,000 is available for the Richmond area. These maps and products are being funded or publicized by means of the Division of Mineral Resources - U. S. Geological Survey topographic mapping program.

Many 1:24,000 scale topographic maps are in process of photorevision as shown in Figure 1. Multicolor county maps, scale 1:50,000, are being prepared for Henry, Prince William, and Roanoke counties. Orthophotoquad coverage is in progress for Alleghany, Craig, Fairfax, Giles, Goochland, Henry, Isle of Wright, Loudoun, Montgomery, Pulaski, Spotsylvania, and York counties and for the cities of Norfolk and Suffolk.

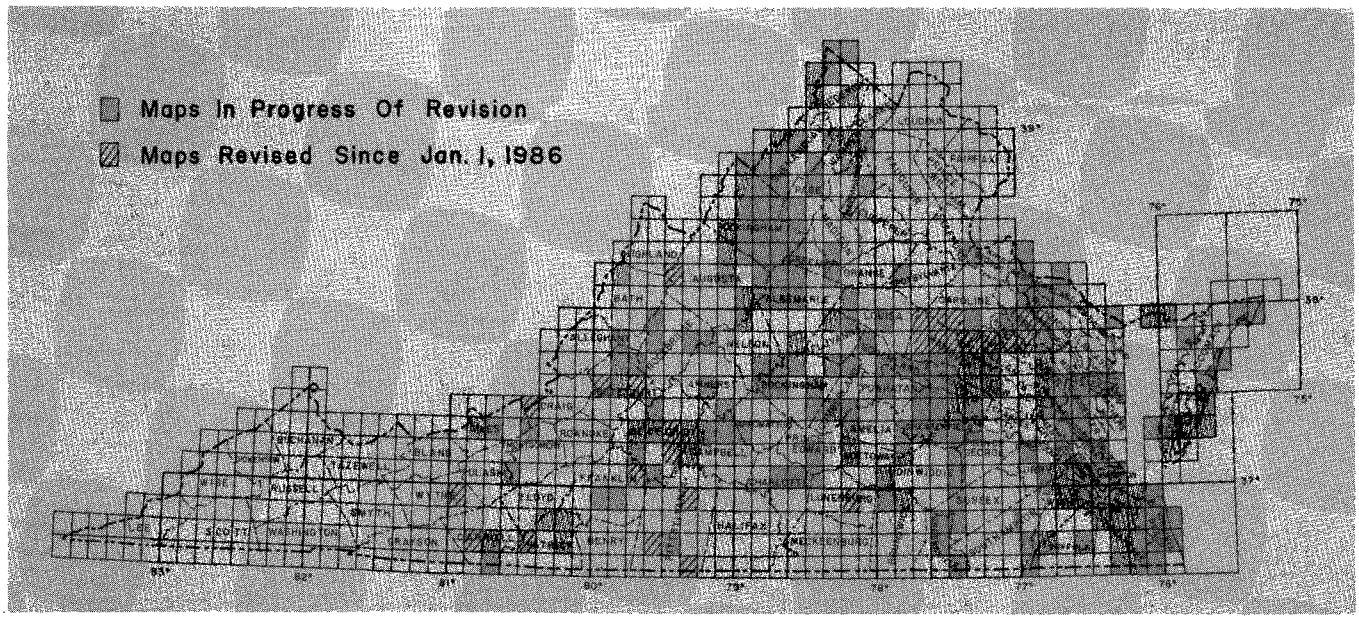

Figure 1. Index map showing the location of twenty-seven photorevised 7.5-minute quadrangles (Scale 1:24,000).

Figure 2. Full-scale portion of the Williamsburg 1:24,000 orthophotoquad. Total map size is 18 x 22 inches.

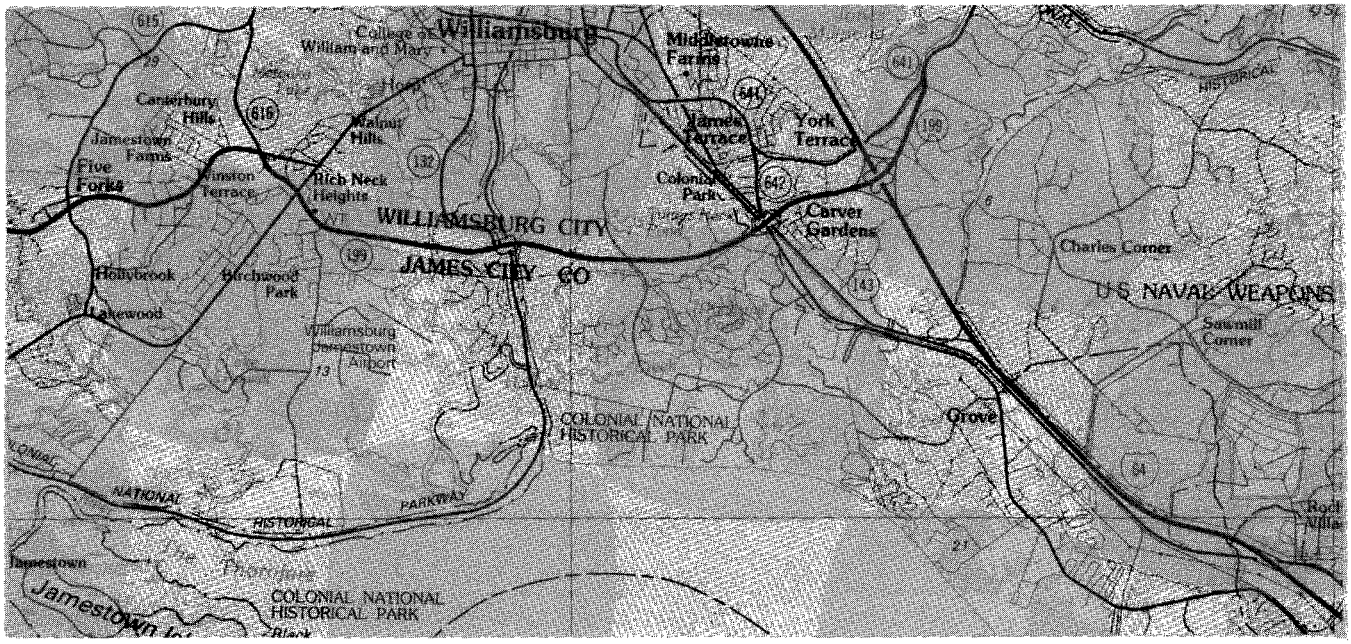

Figure 3. Full-scale portion of the Williamsburg 1:100,000 map. Total map size is 22 x 35 inches.

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Second-class postage paid at
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ISSN 0042-6652

MINERAL UPDATE

LARGE CASSITERITE CRYSTAL FOUND IN POWHATAN COUNTY, VIRGINIA

D. Allen Penick, Jr.

Possibly the largest cassiterite crystal ever found in North America was discovered at the Herbb No. 2 mica mine in Powhatan County, Virginia. This large crystal was removed from the wall of an existing trench during the early fall of 1983 by Donald Richardson, one of the mine owners. Shortly after its discovery, the specimen was purchased by Lawrence Conklin, mineral dealer. Subsequently the specimen was described by a brief note and photograph in the November-December, 1983 issue (vol. 14, no. 6) of *Mineralogical Record.*

The crystal measures 3.5 inches in length, is brown in color, and weighs slightly over 2 pounds. While the crystal is incomplete, it is a magnificent specimen and shows lustrous bipyramidal crystal faces. The identity of the mineral was verified by X-ray analysis in the laboratory of the Defense Intelligence Agency in Washington, DC.

Cassiterite, which is tin oxide (SnO_2), is the major ore of tin and is considered relatively rare in the United States. Other verified Virginia occurrences for cassiterite include three localities in Amelia County and the Irish Creek tin mines in Rockbridge County.

The Herbb No. 2 mine has a long history of producing large mineral specimens. Reference is made to *Virginia Minerals* vol. 29, no. 1, February, 1983, in which a large gem quality topaz crystal and several large beryl crystals were described. Spessartine garnet (generally highly weathered), and microcline (variety amazonite) are other minerals found at the Herbb mine which have grown to impressive size.

The mine, located on the Fine Creek Mills 7.5-minute quadrangle, is 24 miles by road west of Richmond, 3.95 miles northeast of Flat Rock and 0.38 miles along a woods road north of State Route 716 (Figure). Mineral collecting is currently allowed at the Herbb No. 2 mine on a fee basis. For information call Donald Richardson at (804) 598-4031. His mailing address is Route 5, Box 178, Powhatan, Virginia 23139.

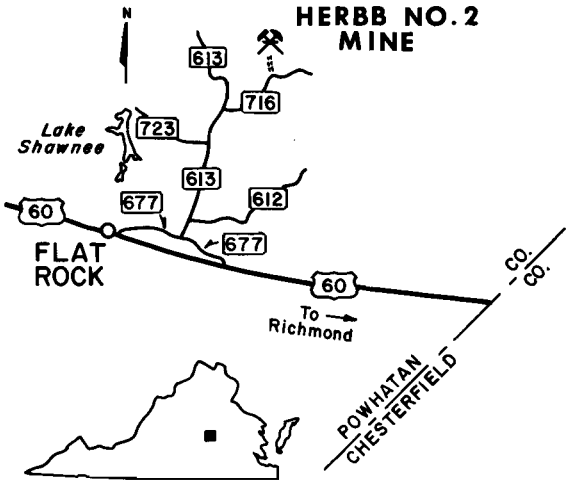

Figure. Location map of the Herbb No. 2 mine; Powhatan County.